

Notice of Allowability

Application No.

10/663,067

Examiner

Eric A. Gates

Applicant(s)

INUZUKA, TORU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's Amendment filed 9 June 2006.
2. ☒ The allowed claim(s) is/are 1,3-5,7 and 9-11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


MONICA CARTER
SUPERVISORY PATENT EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Yasuo Muramatsu on 1 September 2006.

The application has been amended as follows:

Claims

Claim 1. (Currently Amended) A cutting tool assembly comprising: an arbor including a tapered shank portion which has a taper of 7/24 and a spindle nose size of No.30; a cutting tool having at least one cutting blade and fastened to said arbor, said cutting tool being a face milling cutter having a cutting diameter of 80-160 mm; a fastener for fastening said cutting tool to said arbor; and a relative-rotation preventing mechanism for preventing rotation of said cutting tool relative to said arbor; wherein said cutting tool assembly has a weight of not larger than 3 kg; wherein said arbor and said cutting tool have respective contact surfaces which are held in contact with each other; wherein said relative-rotation preventing mechanism is configured by three receiving holes which ~~are formed on a surface of the arbor which is~~ on one of said contact surfaces, and three pins which are formed on the other of said contact surfaces, where an inner shape and

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size of said receiving hole is substantially identical to an outer shape and size of the pin so that each pin is fitted in the corresponding receiving hole; wherein said arbor comprises an annular flange portion which provides the contact surface and has a pair of driving slots formed in an outer circumferential surface of said annular flange portion; and wherein said three pins are ~~equally spaced from an axis of the arbor and~~ equally apart from one another in a circumferential direction of the arbor, and said three pins are positioned relative to said pair of driving slots such that one of said pins is farthest from said driving slots and the two remaining pins do not overlap with said pair of driving slots as seen in an axial direction of said cutting tool assembly.

Claim 9. (Currently Amended) An arbor which is to be fastened to a cutting tool, for establishing a cutting tool assembly, said arbor comprising: a tapered shank portion which has a taper of 7/24 and a spindle nose size of No. 30; a contact surface which is to be brought into contact with a surface of said cutting tool when said arbor fastened to said cutting tool; an annular flange portion which provides the contact surface and has a pair of driving slots formed in an outer circumferential surface of said annular flange portion; and a relative-rotation preventing mechanism for preventing rotation of said cutting tool relative to said arbor when said arbor is fastened to said cutting tool; wherein said relative-rotation preventing mechanism is configured by three pins which are formed on said contact surface of the arbor; wherein said arbor is fastened to said cutting tool which is a face milling cutter having a cutting diameter of 80-160 mm, and wherein an outer shape and size of the protrusion is substantially identical to an inner

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shape and size of a receiving hole formed on said cutting tool, thereby snugly fitting said protrusion into said receiving hole on said cutting tool; wherein said three pins are equally spaced ~~from an axis of the arbor and~~ equally apart from one another in a circumferential direction of the arbor, and said three pins are positioned relative to said pair of driving slots such that one of said pins is farthest from said driving slots and two remaining pins do not overlap with said pair of driving slots as seen in an axial direction of said cutting tool assembly.

Claims 14-16. (Canceled)

Specification

[0040] The arbor 10 is held in contact, at its contact surface provided by a lower end face 12c of the annular flange portion 12, with a contact surface 22a of the face milling cutter 20. A plurality of protrusions are provided on the lower end face 12c of the arbor 10 such that the protrusions are substantially equally spaced apart from each other in the circumferential direction. In the preferred embodiment, the plurality of protrusions are provided by three pins 13 which are respectively fitted in three fitting holes formed in the lower end face 12c. In Fig. 2B, the three pins 13 are ~~equally spaced from a center axis of the arbor and~~ equally apart from one another in a circumferential direction of the arbor. Further, the three pins are positioned relative to the pair of driving slots 12b such that one of the pins 13 is farthest from the driving slots 12b and two remaining pins

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13 do not overlap with the pair of driving slots 12b as seen in an axial direction of the cutting tool assembly. The pins 13 are fitted or received in receiving holes 23 which are formed in the contact surface 22a of the face milling cutter 20 as shown in FIGS. 2A and 2B. The pins 13 and the receiving holes 23 cooperate with one another to constitute a relative-rotation preventing mechanism for preventing rotation of the face milling cutter 20 relative to the arbor 10, namely, preventing displacement of the face milling cutter 20 relative to the arbor 10 in the circumferential direction.

[0059] Where the protrusions are provided by the pins 13 which are fitted in the fitting holes formed in the contact surface 12c of the arbor 10 as in the above-described embodiment, it is preferable, irrespective of the number of the pins 13 and the circumferential spacing distances between the pins 13, that the pins 13 are positioned such that the pins 13 do not overlap with the driving slots 12b (which are formed in the outer circumferential surface of the annular flange portion 12 of the arbor 10), as seen in the axial direction of the arbor 10. The pins 13 are ~~equally spaced from a center axis of the arbor and~~ equally apart from one another in the circumferential direction of the arbor. In the case of using three pins, the pins 13 are positioned relative to the pair of driving slots 12b such that one of the pins 13 is farthest from the driving slots 12b and two remaining pins 13 do not overlap with the pair of driving slots 12b as noted above. This preferable arrangement is effective to avoid This preferable arrangement is effective to avoid reduction of the rigidity of the annular flange portion 12, namely, to

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assure the rigidity of the entirety of the cutting tool assembly 1, for thereby making it possible to perform a machining operation with a high degree of accuracy.

2. Claims 1, 3-5, 7, and 9-11 are allowed. Claims 1 and 9 are the independent claims.

3. The following is an examiner's statement of reasons for allowance:

The closest prior art of record is U.S. Patent 4,325,664 to Mori and U.S. Patent 3,586,343 to Reed, which were applied to the claims in the office action mailed 31 January 2006. Suffice it to say, Mori does not disclose "wherein said three pins are spaced equally apart from one another in a circumferential direction of the arbor, and said three pins are positioned relative to said pair of driving slots such that one of said pins is farthest from said driving slots and the two remaining pins do not overlap with said pair of driving slots as seen in an axial direction of said cutting tool assembly" as claimed in claims 1 and 9. As such, Mori does not anticipate independent claims 1 and 9.

Additionally, modifying the teachings of Mori with those of Reed (noting that Reed teaches three pins 40 that are equally spaced apart from one another in the circumferential direction as taught by Reed in column 2, lines 14-20 and figure 2, for example) would still not result in the present invention as set forth in independent claims 1 and 9. Note that there is no teaching, absent impermissible hindsight, which would motivate one having ordinary skill in the art to provide the pins 40 of Reed to the device taught by Mori such that two of the pins "do not overlap with said pair of driving slots as

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seen in an axial direction of said cutting tool assembly" as set forth in claims 1 and 9. See figure 2 of the Mori reference, noting that the "driving slots" (shown in figure 2, one of which being adjacent the area of the arbor where the reference numeral "10" is located) extend through the flange of the arbor, all the way to the surface into which the pins 27 are inserted. See also, for example, figure 4 of Reed, noting the pins 40 extending into element 33. Thus, to provide the pins 40 of Reed to the arbor of Mori would require that the pins 40 extend into the same surface of the arbor into which the pins 27 of Mori extend, thus providing axial overlap with the pair of driving slots taught by Mori.

Regarding Reed alone, note that Reed does not teach the "pair of driving slots formed in an outer circumferential surface of said annular flange portion", and thus for at least this reasoning, Reed alone doesn't anticipate the present invention as set forth in independent claims 1 and 9.

Furthermore, there is no other combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to so modify the teachings of either Mori or Reed, and thus, for at least the foregoing reasoning, the prior art of record does not render obvious the present invention as set forth in independent claims 1 and 9.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on 571-272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG

1 September 2006



MONICA CARTER
SUPERVISORY PATENT EXAMINER